

program value is a gag program, the network system 5000 may be configured such that a color temperature of illumination is increased to 5000K or more according to a set value, and that the illumination is adjusted to blue-based white illumination.

[0227] In addition, while no one is present in the home, if a certain time period elapses after the digital door lock 5400 is locked, waste of electricity can be prevented by turning off all of turned-on LED lamps 5200. Alternatively, when a security mode is set through the mobile device 5800, if the digital door lock 5400 is locked while no one is present in the home, the LED lamp 5200 may be maintained in a turn-on state.

[0228] Operations of the LED lamp 5200 may be controlled according to surrounding environment information collected by various sensors connected to the network system 5000. For example, when the network system 5000 is realized in a building, illumination, position sensors, and communication modules in the building are combined, and position information of persons in the building is collected, whereby the illumination may be turned on or off. In addition, the collected information is provided in real time, thereby allowing management of facilities or efficient utilization of idle spaces. Generally, since an illumination device such as the LED lamp 5200 is arranged in almost every space of each of floors in the building, various information in the building is collected through a sensor provided integrally with the LED lamp 5200, and can be used for management of facilities, utilization of idle spaces, or the like.

[0229] The LED lamp 5200, an image sensor, a storage device, the communication module 5210 for lamps, and the like are combined, thereby providing a device which can be utilized to maintain building security or to sense and handle emergencies. For example, when a sensor sensing smoke, temperature, or the like is attached to the LED lamp 5200, occurrence of fire, or the like can be quickly sensed, thereby minimizing damage. In addition, illumination brightness may be adjusted in consideration of outdoor weather, an amount of sunshine, or the like, thereby saving energy and providing a comfortable illumination environment.

[0230] As described above, the network system 5000 can be applied to closed spaces such as homes, offices, or buildings as well as applied to open spaces such as streets, parks, or the like. When the network system 5000 needs to be applied to an open space having no physical limit, realization of the network system 5000 may be relatively difficult due to distance limits of wireless communications, communication interference caused by various obstacles, or the like. A sensor, a communication module, and the like are mounted in each of illumination devices, and each of the illumination devices is used as an information collecting means and a communication relay means, whereby the network system 5000 can be more efficiently realized in an open environment as described above. Hereinafter, descriptions will be made with reference to FIG. 23.

[0231] FIG. 23 shows an embodiment of a network system 5000' applied to an open space. Referring to FIG. 23, the network system 5000' according to the present embodiment may include a communication connecting device 5100', a plurality of illumination devices 5200', 5300' communicably connected to the communication connecting device 5100' where the plurality of illumination devices 5200' are arranged at predetermined intervals, a server 5400', a com-

puter 5500' for managing the server 5400', a communication base station 5600', a communication network 5700' connecting the communicable equipment set forth above to each other, a mobile device 5800', and the like.

[0232] Each of the plurality of illumination devices 5200', 5300' mounted in an exterior open space may include smart engines 5210', 5310'. The smart engines 5210', 5310' may include a sensor collecting information of a surrounding environment, a communication module, and the like, in addition to a light emitting element for emitting light, and a driver for driving the light emitting element. By the communication module, the smart engines 5210', 5310' may be communicated with other surrounding equipment according to a communication protocol such as WiFi, Zigbee, LiFi, or the like.

[0233] As an example, one smart engine 5210' may be communicably connected to another smart engine 5310'. Here, a WiFi extension (WiFi mesh) technique may be applied to communications between the smart engines 5210', 5310'. At least one smart engine 5210' may be connected to the communication connecting device 5100', which is connected to the communication network 5700', by wired/wireless communications. To improve an efficiency of communications, several smart engines 5210', 5310' are combined into one group to be connected to the communication connecting device 5100'.

[0234] The communication connecting device 5100' is an access point (AP) which enables wired/wireless communications, and may relay communications between the communication network 5700' and another device. The communication connecting device 5100' may be connected to the communication network 5700' by at least one of wired/wireless manners. As an example, the communication connecting device 5100' may be mechanically accommodated in one of the illumination devices 5200', 5300'.

[0235] The communication connecting device 5100' may be connected to the mobile device 5800' through a communication protocol such as WiFi or the like. A user of the mobile device 5800' may receive surrounding environment information, which is collected by the plurality of smart engines 5210', 5310', through the communication connecting device 5100' connected to the smart engine 5210' of the illumination device 5200' in the vicinity of the mobile device 5800'. The surrounding environment information may include surrounding traffic information, weather information, and the like. The mobile device 5800' may be connected to the communication network 5700' in a wireless cellular communication manner, such as 3G, 4G, or the like, through the communication base station 5600'.

[0236] The server 5400' connected to the communication network 5700' may monitor operation status or the like of each of the illumination devices 5200', 5300' while receiving information collected by the smart engines 5210', 5310' which are respectively mounted in the illumination devices 5200', 5300'. To manage each of the illumination devices 5200', 5300' based on monitoring results of the operation status of each of the illumination devices 5200', 5300', the server 5400' may be connected to the computer 5500' providing a management system. The computer 5500' may execute software or the like which can monitor and manage operation status of each of the illumination devices 5200', 5300', particularly each of the smart engines 5210', 5310'.

[0237] While the inventive concept has been particularly shown and described with reference to embodiments